Page Replacement Visualization

Visualizing the TLB & Page Table access

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Concept

- Page Replacement concept
  - With demand paging, physical memory fills quickly.
  - So, when there is a process fault and memory full, some page must be replaced.
- Highly motivated from the homework problems of the class.

Concept

- Which page should be replaced ?
  - Optimal page replacement.
    - Replace the page that won’t be needed for long time.
    - Nice & optimal, but unrealizable.
  - Least Recently Used(LRU) page replacement.
    - Replace the page that hasn’t been referenced for long time.
    - Nice & good, but expensive.

Purpose

- A teaching tool
- Visualizing algorithms can make them easier to understand
- Both instructors and students can benefit from a simulator - easier to teach, easier to learn

Goals

- Clear, self-explanatory, easy-to-use and to visualize the process
- Provide an opportunity to make the page replacement process easier to understand

Implementation

- Features:
  - Accordion that contains the list of inputs.
  - As the process steps forward, application highlights what & how the process happens
  - Click the step by step process to visualize the page replacement.

Implementation

- Technologies/Codebase used:
  - HTML5
  - AngularJS
  - CSS
  - Bootstrap - responsive CSS framework

Challenges

- Time constraints
  - I had big goals for a short amount of time
- Visualizing an abstract concept is actually quite difficult
  - Finding an effective way to show each part of the process
  - How to lay out all of the details in a scheduling process

Lessons Learned

- Understand the Page reaplacement a lot more clearly
- Able to experience designing and implementing a visualization tool for a (relatively) difficult concept

DEMO